Taurida National V.I. Vernadsky University

International Conference "Functional Materials"

ICFM'2011

ABSTRACTS

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In the book are presented reports abstracts of International Conference "Functional Materials" ICFM'2011. Conference is devoted to actual problems of physics, technology and applications of new materials and structures with the certain functional properties.

For scientists and graduate students in the field of physics, technologies and application of functional materials.

Abstracts are presented in author's edition.

Тези Міжнародної конференції «Функціональні матеріали» ICFM'2011, 3-8 жовтня, 2011 р. – Сімферополь, ДИАЙПИ, 2011. – 468 с.

У книзі представлені тези доповідей Міжнародної конференції «Функціональні матеріали» ICFM'2011. Конференція присвячена актуальним проблемам фізики, технології та застосування нових матеріалів і структур з певними функціональними властивостями.

Для учених та аспірантів, які працюють в області фізики, технології і застосування функціональних матеріалів.

Тези представлені в авторській редакції.

Тезисы Международной конференции «Функциональные материалы» ICFM'2011, 3-8 октября, 2011 г. – Симферополь, ДІАЙПІ, 2011. – 468 с.

В книге представлены тезисы докладов Международной конференции «Функциональные материалы» ICFM'2011. Конференция посвящена актуальным проблемам физики, технологии и применения новых материалов и структур с определенными функциональными свойствами.

Для ученых и аспирантов, которые работают в области физики, технологии и применения функциональных материалов.

Тезисы представлены в авторской редакции.

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EQ-1P/18 **Nature of spin-echo amplitude oscillations in natrolite**

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The modulation of the decay of the solid-echo amplitude (the solid-echo is the spin-echo signal, which is observed after action on the sample by the pulse sequence $(90^0_0 - \tau - 90^0_{90^0} - t)$) in the crystallohydrates was observed earlier (see [1, 2] and references given there). The authors of that works explained the nonmonotonic (oscillated) nature of the echo amplitude decay as intermolecular interactions between the magnetic moments of the protons of different molecules of water. In the present work another model is proposed, which explains modulation of the solid-echo amplitude. In contrast to the results of the previous works we assume that the modulation effects of solid-echo amplitude can be connected with the processes of the internal mobility of the water molecules in crystallohydrates. We have developed a theory by which it is possible to obtain parameters of molecular mobility by measuring of the decay of echo oscillation.

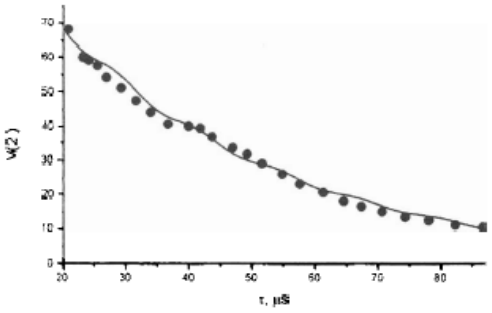

Figure represents the theoretical and experimental dependences of solid echo amplitude from impulse delay between pulses τ in monocrystalline natrolite $Na_2Al_2Si_3O_{10}\ 2H_2O$ for the orientation of crystal $\vec{B}_0 \| [110]$ at $T = 300K$. For this crystal orientation the NMR spectrum represent two Pake's doublets with $\Delta\nu_1 = -45{,}5kHz$ and $\Delta\nu_2 = 41{,}3kHz$ [3].

Figure. Theoretical and experimental dependences of solid echo amplitude from delay τ in monocrystalline natrolite.

From comparison experimental and theoretical curves we have obtained $\Delta \cong 40kHz$ and this value is well agreed with literature date $\Delta = \nu_2 - \nu_1 = 48{,}4kHz$ [3]. The obtained correlation time for molecular diffusion $\tau_c \cong 10^{-4}s$ also satisfactorily coincides with date obtained at investigation of water molecule diffusion in natrolite [3, 4].

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